

nomenon. The physiologic preliminaries for ovulation have been noted by the writer on many instances in his detailed studies of two most accessible species of this State. It was found that the ovisacs were frequently distended with water before being filled with eggs, a reproductive function that may be necessary in all species in order that the ova may not be injured, that greater numbers may be admitted and that the laminae may be stretched to a thinness more suitable for the aëration of the embryos.

A NEW OVULA FROM CALIFORNIA.

BY S. STILLMAN BERRY.

NEOSIMNIA CATALINENSIS, new species.

Shell very thin, fusiform, swollen above the middle, maximum diameter contained about $2\frac{1}{2}$ times in the length; color a nearly pure porcelain or pearly white, the extreme ends tinted with brownish yellow for a distance of 2 to 3 mm. Surface polished and glossy; closely and finely longitudinally striate, the striae readily visible to the eye and rather irregular, a few being somewhat coarser than the remainder. Spiral sculpture comprising some 20-25 low cords at each end, becoming minutely wavy as they are intersected by the longitudinal striae; indications of an extremely faint wavy spiral striation over the rest of the shell are discovered by a strong lens. Shell pointed at both ends, but distinctly more produced at the apex than the base. Outer lip not greatly thickened, bordered by a narrow white callus; retracted at both ends, in each instance with an obscure angle. Columella sinuous; a low spiral fold and channel at the summit obliquely encircling the axis.

Length 23 mm. ; maximum diameter $8\frac{1}{2}$ mm.

Type: Cat. No. 1224 of the writer's collection.

Type Locality: 50 fathoms, off Avalon, Santa Catalina Island, California (Avalon Aquarium, August 1906).

Remarks: The type and a young specimen from the same locality taken by J. H. Paine in 1903 are before me. *N. catalinensis* does not seem to be very similar to any of the related

forms which I can find to have been described from this region. It is a more delicate and inflated species than either *variabilis* C. B. Adams or *vidleri* Sowerby, if I am correct in my determination of these forms, and not at all close to either. It seems to be nearest to the *O. barbarensis* Dall, but the latter is much more compact, more solid, and more highly tinted, as well as usually of considerably smaller size. While it is possible that the relatively thin callus on the lip is indicative of immaturity, another large specimen which has come to my notice from the San Pedro Channel agrees in this as in every other particular.

A figure will appear on a plate of this volume.

THE CONJUGATION OF *ARIOLIMAX CALIFORNICUS*.

BY HAROLD HEATH.

The newly hatched young of *Ariolimax californicus* measure approximately five eighths of an inch in length, and under favorable conditions become from three to three and a half inches long at end of four months. Full-sized adults, measuring in the neighborhood of eight inches, probably reach such dimensions in not over ten months. A three-inch individual possesses all of the essential features of the adult, though the constituent organs of the reproductive system are of small size.

For several years the specimens of this species that are used for class dissection at Stanford University have been collected from a nearby and comparatively circumscribed area along the San Francisquito creek where the conditions throughout are uniform. It was therefore surprising to find that annually fully five per cent of the large-sized animals dissected in the classroom lacked the penis entirely, while in an equal number it was abnormally undeveloped when compared with that of smaller individuals which had not yet reached sexual maturity. As the years went by the conviction became stronger that at some previous time the penis in all such specimens had been cast off, and that its diminutive proportions in otherwise fully formed animals represented a regenerative stage.

To test the correctness of the hypothesis fully two hundred